

60/ 12/1/97 12/1/96 10/20/96
AMENDMENTS TO THE CLAIMS

1. (currently amended) A genetically engineered mutant *C. fetus* strain derived from strain 23D (PTA-4754), said mutant strain contains ~~containing~~ a DNA cassette inserted into the coding sequence of a *sapA* homolog of said 23D strain, wherein said DNA cassette encodes a heterologous protein and expression of said DNA cassette results in surface expression of a chimeric protein comprising a 5' LPS-binding region of said *sapA* homolog, said heterologous protein and a 3' secretion signal region of said *sapA* homolog—said heterologous protein. Condition

2-4. (canceled)

5. (previously amended) The mutant *C. fetus* strain of claim 1, wherein said heterologous protein is an immunogen of a pathogen selected from the group consisting of *Salmonella*, *Shigella*, *Campylobacter jejuni*, *E. coli* 0157:H7, human immunodeficiency virus (HIV), simian immunodeficiency virus (SIV) and animal pathogens.

6. (canceled)

7. (canceled)

8. (original) The mutant *C. fetus* strain of claim 1, wherein said protein is selected from the group consisting of an antigen and a therapeutic agent.

9. (currently amended) A method of immunizing a host to develop mucosal and systemic immune responses to an immunogen carried by the mutant strain of claim 5, comprising the step of administering to said host a ~~pharmacologically effective dose of the~~ mutant strain of claim 5.

10. (currently amended) A mutant *C. fetus* strain derived from *recA* mutant strain 97-211 (PTA-4753) said mutant *C. fetus* strain expresses ~~expressing~~ only one S-layer protein encoded by one *sapA* homolog due to a *recA* mutation that results in no functional RecA protein expression.

11. (currently amended) The mutant *C. fetus* strain of claim 10, ~~further comprises wherein said strain contains~~ a DNA cassette inserted into the coding sequence of a *sapA* homolog of said strain, ~~and said DNA cassette encodes a heterologous protein and~~ expression of said DNA cassette results in surface expression of a chimeric protein comprising said heterologous protein.

12. (currently amended) A mixture of mutant *C. fetus* strains derived from *recA* mutant strain 97-211 (PTA-4753) wherein due to *recA* mutation ~~there is that results in~~ no functional RecA protein expression in each of said strains, each of said strains ~~further comprises a DNA cassette inserted into the coding sequence of a *sapA* homolog of said strain, said DNA cassette encodes a different heterologous protein in each of said mutant strains and expression of said DNA cassette results in surface expression of a chimeric protein comprising a different heterologous protein in each of said mutant strains~~ expresses only one S-layer protein comprising a heterologous antigen and a *sapA* homolog.

13. (currently amended) A method of immunizing a host to develop mucosal and systemic immune responses to the heterologous protein carried by the mutant strain of claim 11 the ~~antigens of claim 12~~, comprising the step of administering to said host a ~~pharmacologically effective dose of the mutant strains of~~ claim ~~11~~ 12.

14. (canceled)

15. (currently amended) A strain of *Escherichia coli* (PTA-4750) ~~coli~~, modified to express the surface array proteins C, D, E and F of *C. fetus* strain 23D, wherein said surface array proteins are encoded by the pIR100 plasmid contained in said strain of *E. coli*.

16. (currently amended) The *Escherichia coli* ~~coli~~ of claim 15, further ~~comprises~~ ~~comprising~~ a chimeric protein encoded by sequences comprising a 5' LPS-binding region of a *sapA* homolog of *C. fetus* strain 23D, a 3' secretion signal region of said a *sapA* homolog and sequence encoding a heterologous protein inserted between said binding region and said signal region.

17. (currently amended) A method of immunizing a host to generate immune responses to the heterologous protein carried by the *Escherichia coli* of claim 16 an immunogen, comprising the step of administering to said host a ~~pharmacologically effective dose of~~ the *Escherichia coli* ~~coli~~ of claim ~~16~~ 15.

18. (canceled)